

AMENDMENT TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

In The Claims

1. (Currently Amended) A method of irradiating an article from a radiation source where the article absorbs the radiation at different positions in the article in accordance with irregularities in the characteristics of the article at the different positions, including the steps of:
 - providing [[the]] radiation from the source in a particular direction,
 - providing a closed container ~~including the housing a plurality of articles in a~~
predetermined configuration,
 - ~~removably coupling a fixture to an external surface of the closed container; and~~
 - ~~absorbing the radiation energy passing from the source to the articles at the different positions in the closed container in accordance with the irregularities in the characteristic of the article at the different positions to maintain the radiation dose at the different positions in the article within particular minimum and maximum limits, and~~
 - ~~moving the closed container and fixture through past the radiation from the source in a direction transverse to the particular direction such that radiation energy passing from the source is absorbed by the articles,~~
 - ~~wherein the fixture is coupled to the closed container such that when the closed container and fixture are moved through the radiation the fixture is located between the radiation source and the articles;~~
 - ~~wherein the absorption is provided by a fixture has having characteristics for absorbing the radiation energy such that the radiation dose at different positions in each article is~~

maintained within particular minimum and maximum limits despite at the different positions
~~depending upon the~~ irregularities in the characteristics of the article at the different positions;
~~wherein the article is disposed within the closed container and the fixture is disposed~~
~~external to the closed container.~~

2. (Canceled)

3. (Previously Presented) A method as set forth in claim 1 wherein
the articles in the closed container are moved past the radiation from the source in a
direction substantially perpendicular to the particular direction and wherein
the articles have at least one of an irregular configuration and density and the fixture has
at least one of a configuration and density which, when combined with the at least one of the
configuration and density of the articles in the closed container, provides at least one of a regular
configuration and density.

4. (Currently Amended) A method of irradiating articles from a radiation source
where the articles absorb the radiation from the source at different positions in the articles in
accordance with irregularities in the characteristics of the articles at the different positions,
including the steps of:

providing radiation from the source in a particular direction,

providing a closed container including [[the]] a plurality of articles held in a
predetermined configuration,

moving the articles in the closed container past the radiation from the source in a second
direction transverse to the particular direction, and

providing for the absorption of the radiation energy from the source within particular minimum and maximum limits at the different positions in the articles in the closed container regardless of the irregularities in the characteristics of the articles at the different positions,

wherein the absorption of the radiation energy from the source within the particular minimum and maximum limits is controlled by a fixture having irregularities complementary at the different positions to the irregularities provided by the article at the different positions,

wherein the articles are disposed within the closed container and the fixture is disposed external to the closed container.

5. (Canceled)

6. (Original) A method as set forth in claim 4 wherein the articles are conveyed past the radiation source in a direction substantially perpendicular to the particular direction and at a substantially constant speed.

7. (Currently Amended) A method of irradiating articles from a radiation source where the articles absorb the irradiation from the source at different positions in the articles in accordance with irregularities in the characteristics of the articles at the different positions, including the steps of:

providing radiation from the source in a particular direction,

providing a closed container including [[the]] a plurality of articles held in a predetermined configuration,

moving the articles past the radiation from the source in a second direction substantially perpendicular to the particular direction, and

compensating outside of the closed container for the irregularities in the characteristics of the articles in the closed container at the different positions in the article to provide a uniformity in the radiation dose at the different positions in the articles in the closed container within particular minimum and maximum limits,

wherein the irregularities in the article at the different positions result from irregularities in the dimension of the article in the particular direction at the different positions,

wherein the compensation is provided for the irregularities in the dimension of the article in the particular direction at the different positions,

wherein the articles are disposed within the closed container and the fixture is disposed external to the closed container.

8. (Canceled)

9. (Previously Presented) A method as set forth in claim 7 wherein the article is conveyed past the radiation from the source in a direction substantially perpendicular to the particular direction.

10. (Currently Amended) A method of irradiating an article from a radiation source where the article has irregular characteristics including at least one of an irregular geometrical shape and density and absorbs radiation passing through the article by an amount depending upon the irregular characteristics, including the at least one of the irregular geometrical shape and density, of the article and where the article has different absorption characteristics to radiation at progressive positions in the article, including the steps of:

providing the radiation from the radiation source in a first direction,

providing a closed container including a plurality of [[the]] articles inside the closed container held in a predetermined configuration,

providing outside of the closed container a fixture having irregular characteristics, including at least one of an irregular geometric shape and density, at progressive positions to compensate for the differences in the irregularities of the characteristics, including irregularities in the at least one of the geometric shape and density, of the articles in the closed container at the progressive positions,

disposing the fixture relative to the articles in the closed container to provide the combination of the articles and the fixture with the compensating characteristics at the progressive positions in response to the radiation, and

moving the combination of the closed container and the fixture at the progressive positions past the radiation source to irradiate the articles in the closed container at the progressive positions.

11. (Previously Presented) A method as set forth in claim 10 wherein the fixture has irregular characteristics at progressive positions, depending upon the irregularities in the characteristics of the articles in the closed container at the progressive positions, to compensate for the irregularities in the characteristics of the articles at the progressive positions.

12. (Previously Presented) A method as set forth in claim 10 wherein the combination of the closed container and the fixture is moved past the radiation from the radiation source at a substantially constant speed in a direction substantially perpendicular to the direction of the radiation.

13. (Previously Presented) A method as set forth in claim 10 wherein the fixture is made from a material selected from a group consisting of a plastic and a metal and having characteristics of absorbing the radiation substantially corresponding to the characteristics of the article in the closed container in absorbing the radiation.

14. (Currently Amended) A method of irradiating articles from a radiation source where the articles have characteristics of absorbing at progressive positions different doses of radiation per unit of distance of travel of radiation through the article, including the steps of:

providing radiation in a particular direction from the source,

providing a closed container including a plurality of articles held in a predetermined configuration,

providing a fixture having characteristics of absorbing at progressive positions in the fixture different doses of radiation per unit of distance of travel of the radiation through the fixture, the different doses of the radiation per unit of distance of the travel of the radiation through the fixture corresponding to the different doses of the radiation per unit of distance of travel of the radiation through the articles to maintain within particular minimum and maximum limits at the progressive positions the amount of radiation received by the article per unit of travel of the radiation through the article,

disposing the fixture external to the closed container and relative to the articles in the closed container to maintain within particular limits at the progressive positions the dose of radiation received by the articles per unit of distance of travel of the radiation through the articles, and

moving the combination of the closed container and the fixture at the progressive positions past the radiation from the radiation source to obtain the absorption by the articles of

the radiation from the source within the particular limits at the progressive positions in the articles.

15. (Previously Presented) A method as set forth in claim 14 wherein the combination of the closed container and the fixture is moved past the radiation from the radiation source at a substantially constant speed in a direction substantially perpendicular to the direction of the radiation from the source.

16. (Original) A method as set forth in claim 15 wherein each of the containers and each of the associated fixtures is spaced from the adjacent containers and fixtures by a particular distance within particular limits when the containers and the associated fixtures are moved past the radiation from the source.

17. (Currently Amended) A method of irradiating articles from a radiation source where the articles absorb radiation passing through the article by a dosage depending upon irregularities in the characteristics, including irregularities in the at least one of the geometric shape and density, of the articles and where the articles have different absorption characteristics to radiation at progressive positions in the articles, including the steps of:

providing the radiation from the radiation source in a first direction,
providing a closed container including the articles held in a predetermined configuration,
providing a fixture having at the progressive positions characteristics, including at least one of the geometric shape and density, constituting a difference between substantially constant characteristics and the irregularities in the characteristics of the articles in the closed container at the progressive positions,

disposing the fixture exteriorly relative to the closed container to provide the substantially constant characteristics for the combination of the articles in the closed container and the fixture at the progressive positions, and

moving the combination of the closed container and the fixture past the radiation from the source at the progressive positions.

18. (Previously Presented) A method as set forth in claim 17 wherein the combination of the closed container and the article are moved past the radiation from the source in a second direction substantially perpendicular to the first direction.

19. (Original) A method as set forth in claim 17 wherein the articles have irregularities in at least one of the dimension and the density of the fixture in the first direction at the progressive positions and wherein the fixture has irregularities in the at least one of the dimension and density of the articles in the first direction at the progressive positions to provide a substantially constant dimension in the first direction at the progressive positions when the at least one of the dimensions and density of the article and the fixture in the first direction at the progressive positions are combined.

20. (Previously Presented) A method as set forth in claim 17 wherein the progressive positions in the articles in the closed container and in the fixture are in a direction substantially perpendicular to the first direction.

21. (Currently Amended) A method of irradiating articles from a radiation source where the articles absorb radiation passing through the articles by a dosage depending upon the characteristics, including at least one of the geometric shape and the density, of the articles and

where the articles have different absorption characteristics to radiation at progressive positions in the articles, including the steps of:

providing the radiation from the radiation source in a first direction,
providing a closed container including the articles held in a predetermined configuration,
providing a fixture with characteristics of absorbing the radiation corresponding to the characteristics of the articles to provide a substantially constant absorption in the articles in accordance with a difference between a substantially constant absorption and the absorption of the radiation by the articles at the progressive positions,

disposing the fixture exteriorly of the closed container to provide the substantially constant absorption at the progressive positions of the combination of each of the articles in the closed container and the fixture, and

moving the combination of the closed container and the fixture past the radiation from the source in a direction substantially perpendicular to the first direction.

22. (Previously Presented) A method as set forth in claim 21 wherein
the characteristics in the articles include the at least one of the geometrical shape and density of the articles and wherein the characteristics in the fixture include the at least one of the geometrical shape and density of the fixture and wherein

the at least one of the geometrical shape and density of the fixture provides the difference between the substantially constant characteristics and the irregularities in the at least one of the geometric shape of the articles in the closed container at the progressive positions.

23. (Previously Presented) A method as set forth in claim 21 wherein

the fixture includes two (2) fixture portions respectively disposed exteriorly of the closed container on the opposite sides of the closed container in the direction of the radiation from the source.

24. (Previously Presented) A method as set forth in claim 21 wherein the fixture includes a single fixture having at least one of the a geometrical shape and density providing the difference between the substantially constant characteristics and the irregularities in the articles in the closed container at the opposite sides of the articles.

25. (Currently Amended) A method of irradiating articles from a radiation source where the articles absorb radiation by a dosage depending upon the characteristics of the articles and where the articles have different absorption characteristics to the radiation at progressive positions in the articles, the absorption of the radiation in the articles being dependent upon the at least one of the composition and geometric shape and density of the articles, including the steps of:

providing the radiation from the source in a particular direction,
providing a closed container including the articles held in a predetermined configuration,
providing a fixture having a composition with characteristics of absorbing the radiation corresponding to the absorption of the radiation by the at least one of the composition density and geometrical shape of the articles and having at progressive positions absorption characteristics compensating the absorption characteristics of the articles at the progressive positions,

disposing the fixture outside of the closed container to provide the at least one of a substantially constant geometric shape, density and composition between the combination of the articles and the fixture at progressive positions on the articles, and

moving the combination of the closed container and the fixture past the radiation from the source in a direction substantially perpendicular to the radiation from the source.

26. (Original) A method as set forth in claim 25 wherein

the articles are provided with irregularities in at least one of their geometric shape, composition and density and wherein

the fixture is provided with irregularities in the at least one of its geometric shape, composition and density and wherein

the irregularities in the at least one of the geometric shape, density and composition of the fixture at the progressive positions are complementary to the at least one of the irregularities in the geometric shape, density and compositions of the articles at the progressive positions.

27. (Original) A method as set forth in claim 26 wherein

the irregularities in the at least one of the geometric shape, density and composition of the articles are disposed on the opposite sides of the articles in the direction of the radiation from the source.

28. (Original) A method as set forth in claim 25 wherein

the irregularities in the at least one of the geometric shape, composition and density of the fixture are disposed on a single side of the articles in the direction of the radiation from the source.

29. (Currently Amended) In combination,

a radiation source for providing radiation in a particular direction,

a closed container including a plurality of articles held in a predetermined configuration each having irregularities in its characteristics at different positions in the article where the irregularities in the characteristics produce non-uniformities in the absorption or dosage in the article from the radiation source,

a fixture disposed outside of the closed container and having characteristics of absorbing the radiation energy from the source at the different positions, relative to the irregularities in the absorption by the articles at the different positions, to provide a substantial uniformity in the absorbed dosage at the different positions in the articles within particular minimum and maximum limits, and

a conveyor for moving the closed container and the fixture past the radiation from the source in a direction perpendicular to the particular direction.

30. (Original) In a combination as set forth in claim 29 wherein

the irregularities in the characteristics of the articles include irregularities at least one of in the geometrical shape, density and composition of the articles and wherein
the irregularities in the characteristics of the fixture include irregularities in the at least one of the geometrical shape, density and composition of the fixture.

31. (Original) In a combination as set forth in claim 29 wherein
the combination of the irregularities in the at least one of the geometrical shape, density
and composition of the articles and the irregularities in the at least one of fixture provide at least
one of the substantially constant geometrical shapes, density and composition of the articles
within particular minimum and maximum limits.

32. (Currently Amended) In combination,
a radiation source for providing radiation in a particular direction,
a closed container including a plurality of articles held in a predetermined configuration
each having irregularities in its characteristics at different positions in the article where the
irregularities in its characteristics affect the radiation dosage absorbed by the article at the
different positions from the radiation source,
a fixture having irregularities in its characteristics to compensate for the irregularities in
the characteristics of the articles, the fixture being disposed outside of the closed container, and
a conveyor for moving the closed container and the fixture in a direction substantially
perpendicular to the particular direction.

33. (Original) In a combination as set forth in claim 32 wherein
the irregularities in the characteristics of the articles constitute at least irregularities in the
at least one of the geometrical shapes, density and composition of the articles and wherein
the irregularities in the characteristics of the fixture constitute irregularities in at least one
of the geometrical shapes, density and composition of the fixture.

34. (Original) In a combination as set forth in claim 32 wherein
the irregularities in the at least one of the geometrical shape, density and composition of
the article constitute irregularities in at least one of the dimension, density and composition of
the article in the direction of the radiation from the source and wherein

the irregularities in the at least one of the geometrical shape, density and composition of
the fixture constitute irregularities in the at least one of the dimension, density and composition
of the fixture in the direction of the radiation from the source.

35. (Previously Presented) In a combination as set forth in claim 32 wherein
the closed container is moved past the radiation from the source at a substantially
constant speed within particular limits

36. (Previously Presented) In a combination as set forth in claim 32 wherein
the closed container is one of a sequence of closed containers and wherein the fixture is
one of a sequence of fixtures and wherein the closed containers and the fixtures are moved in
sequence past the radiation from the source at a substantially constant speed within particular
limits and wherein

the closed containers and the fixtures are moved in sequence past the radiation from the
source with a minimal separation between the closed containers within particular limits.

37. (Currently Amended) In combination for receiving radiation in a particular
direction from a radiation source,

a closed container including a plurality of articles held in a predetermined configuration each having irregularities in its characteristics at different positions in the article where the irregularities in the characteristics of the article cause irregularities to be produced in the dosage received by the article from the radiation source at the different positions, and

a fixture having irregularities in its characteristics at different positions in the fixture where the irregularities in the characteristics of the fixture cause irregularities to be produced in the dosage received by the articles from the radiation source at the different positions, the irregularities in the characteristics of the fixture at the different positions complementing the irregularities in the characteristics of the articles at the different positions to provide a substantial uniformity in the dosage at the different positions in the articles within particular minimum and maximum limits,

wherein the articles are disposed within the closed container and the fixture is disposed external to the closed container.

38. (Original) In a combination as set forth in claim 37,
the fixture and the articles being movable past the radiation from the source to receive radiation from the source.

39. (Previously Presented) In a combination as set forth in claim 37,
the fixture including a first fixture portion on one side of the articles and a second fixture portion on the opposite side of the articles, the first and second fixture portions being separated from each other, and the closed container being disposed between the fixtures in a direction corresponding to the direction of the radiation from the source.

40. (Previously Presented) In a combination as set forth in claim 38, the articles having irregularities in its characteristics at the different positions on opposite sides of the articles and the fixture being provided with irregularities in its characteristics at the opposite sides of the closed container to compensate for the irregularities in the characteristics of the articles and to provide substantially the uniformity in the radiation dosage at the different positions in the articles within the particular minimum and maximum limits.

41. (Previously Presented) In a combination as set forth in claim 37, the fixture being disposed on one side of the closed container and being provided with irregularities in its characteristics to compensate for the irregularities in the characteristics of the articles on the opposite sides of the articles and to provide substantially the uniformity in the radiation dosage at the different positions in the articles within the particular minimum and maximum limits.

42. (Original) In a combination as set forth in claim 37, the fixture including a first fixture portion on one of the opposite sides of the articles and including a second fixture portion on the other of the opposite sides of the articles, the first fixture portion having irregularities in its characteristics to compensate for the irregularities in the characteristics of the articles on the one of the opposite sides of the articles and the second fixture portion having irregularities in the characteristics of the articles on the other of the opposite sides of the articles to compensate for the irregularities in the articles on the other of the opposite sides of the articles.

43. (Currently Amended) In combination for receiving radiation in a particular direction from a radiation source,

a closed container including a plurality of articles held in a predetermined configuration each having irregularities in its characteristics at different positions in the articles, and

a fixture disposed relative to the closed container and having irregularities in its characteristics for compensating for the irregularities in the characteristics in the articles in the closed container at the different positions in the articles to provide substantially a uniformity in the characteristics of the articles at the different positions within particular minimum and maximum limits,

wherein the articles are disposed within the closed container and the fixture is disposed external to the closed container.

44. (Previously Presented) In a combination as set forth in claim 43, the closed container and the fixture being disposed relative to the radiation source to provide for the passage of the radiation from the source through the articles in the closed container and the fixture.

45. (Original) In a combination as set forth in claim 43, the irregularities in the characteristics of the articles constituting at least irregularities in at least one of the geometrical shape, density and composition of the articles and the irregularities in the characteristics of the fixture constituting irregularities in at least one of the geometrical shape, density and characteristics of the fixture.

46. (Currently amended) In combination,

a closed container,

a plurality of articles disposed in the closed container such that they are held in a predetermined configuration to be irradiated, each of the articles having irregularities in its characteristics at progressive positions in the articles in response to radiation, and

a fixture disposed externally of the closed container and having irregularities in its characteristics at progressive positions in response to radiation to compensate for the irregularities in the characteristics of the articles in the closed container at the progressive positions.

47. (Original) In a combination as set forth in claim 46 wherein

the irregularities in the characteristics of the articles and in the fixtures provide irregularities in the response of the articles and the fixtures to radiation.

48. (Previously Presented) In a combination as set forth in claim 46,

a conveyor for moving the closed container and the fixture in a first direction, and

a source of radiation disposed relative to the closed container and the fixture for irradiating the articles in the closed container and the fixture in a second direction substantially perpendicular to the first direction.

49. (Previously Presented) In a combination as set forth in claim 46 wherein

the fixture is made from a material selected from a group consisting of a plastic and a metal and having substantially the same characteristics per unit of distance of absorbing irradiation as the articles in the closed container.

50. (Original) In a combination as set forth in claim 48 wherein the irregularities in the characteristics of the articles and in the fixtures provide irregularities in the absorption of radiation of the articles and the fixtures to radiation.

51. (Previously Presented) In a combination as set forth in claim 46, a conveyor for moving the closed container and the fixture in a first direction, and a source of radiation disposed relative to the closed container and the fixture for irradiating the articles in the closed container and the fixture in a second direction substantially perpendicular to the first direction.

52. (Previously Presented) In a combination as set forth in claim 47 wherein the fixture is made from a material selected from a group consisting of a plastic and a metal and having substantially the same characteristics of absorbing radiation as the articles in the closed container.